

REPORT DOCUMENTATION PAGE					Form Approved OMB No. 0704-0188	
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GORDON RESEARCH CONFERENCES

FINAL PROGRESS REPORT

Office of Naval Research
Grant Number N00014-15-1-2415

Multifunctional Materials & Structures GRC
January 31-February 5, 2016

Operational Summary

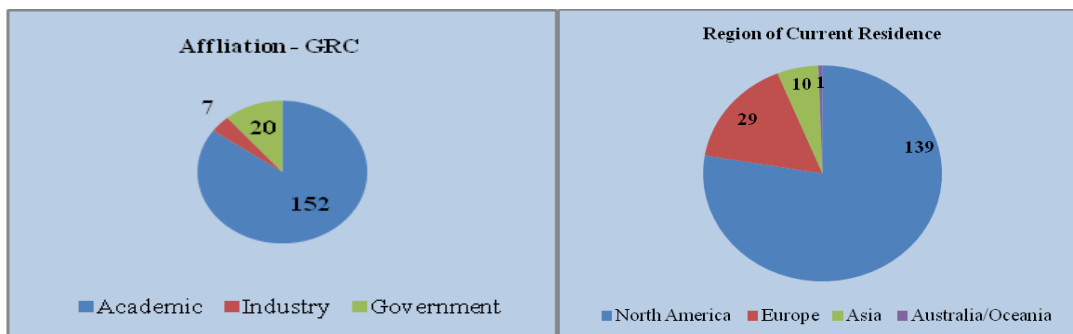
The Gordon Research Conference (GRC) on Multifunctional Materials & Structures was held at the Four Points Sheraton in Ventura, California from January 31-February 5, 2016. The meeting covered a variety of scientific topics and the content presented was highly rated by participants.



Conference Participants

The new Conference was well-attended with 179 participants. Scientists from academia represented 85% of the participants while attendees from government accounted for 11% and those from industry totaled 4%. The meeting also attracted a strong mix of young investigators and senior scientists. Students and post-docs accounted for 30% of all attendees.

Of the 179 attendees, 94 voluntarily responded to a general inquiry regarding ethnicity on the GRC registration form. Of the 94 respondents 4% were minorities, 46% Hispanic and 0% African American. Approximately 23% of the participants at the 2016 meeting were women.



Conference Program

The Gordon Research Conference on Multifunctional Materials and Structures aimed to extend and accelerate interdisciplinary research activities in this emerging field, which incorporates mechanics, materials science, engineering science, physics, chemistry and biology. Multifunctional design encompasses materials, structures and/or material systems that have the ability to perform multiple functions through judicious combinations of structural properties and at least one additional functional capability as dictated by the system application requirements. The individual material elements are participating, concurrently or sequentially, in distinct, beneficial physical processes thereby delivering truly dramatic improvements in system-level efficiency beyond possible incremental improvements. Visionary contexts for multifunctional systems include (a) "autonomic" structures that can sense, diagnose and respond to external stimuli with minimal external intervention, (b) "adaptive" structures allowing reconfiguration or readjustment of functionality, shape and mechanical properties on demand, and (c) "self-sustaining" systems with structurally integrated power harvest/storage/transmission capabilities. The conference addressed key scientific issues underpinning the advancement of these systems such as: translation of model biological functions to synthetic materials, accelerating transport or dynamic chemical changes in strong, stiff materials, optimizing interfaces between hard and soft materials, multi-physics modeling of multi-component systems, etc. The meeting brought together a cross-section of academic scholars, government researchers and planners, and industry professionals thus catalyzing new efforts and worldwide collaborations.

Conference Budget

Funding provided by the Office of Naval Research supported partial registration and travel for graduate students, professors, assistant professors, research scientist and research directors at the meeting.

Conference Feedback

Participants had an opportunity to provide feedback at the end of the Conference. The feedback collected from the meeting was extremely positive. Evaluations included numerous positive remarks regarding the high quality discussions, well balanced program, the novel ideas presented and the variety of speakers.

GRC would like to thank the Office of Naval Research for its continued support of the meetings. The contributions received from the Office of Naval Research have been critical to the success of the conferences and are having a measurable impact in advancing the frontiers of science worldwide.

Dr. B. L. (Les) Lee, GRC Chair
Johns Hopkins University

Dr. Nancy Ryan Gray
President and Chief Executive Officer
Gordon Research Conferences

Multifunctional Materials & Structures
Gordon Research Conference
 The Science of Autonomic, Adaptive and Self-Sustaining Systems
 January 31 - February 5, 2016
Four Points Sheraton / Holiday Inn Express
Ventura, CA
 Chairs: **B. L. (Les) Lee** & **Scott R. White**
 Vice Chairs: **James P. Thomas** & **Nancy R. Sottos**

Contributors



Final Meeting Program

Sunday

4:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm	Dinner
7:30 pm - 7:40 pm	Welcome / Introductory Comments by GRC Site Staff
7:40 pm - 9:30 pm	Sensing and Self-Diagnosis
	Discussion Leader: Donald Leo (University of Georgia, USA)
7:40 pm - 7:45 pm	Opening Remarks
7:45 pm - 7:50 pm	Introduction by Discussion Leader
7:50 pm - 8:25 pm	Fu-Kuo Chang (Stanford University, USA) "Neurological System-Inspired Sensing Materials for Fly-by-Feel Autonomous Vehicles"
8:25 pm - 8:40 pm	Discussion
8:40 pm - 9:15 pm	Yong Chen (University of California, Los Angeles, USA) "Neuromorphic Network Based on Carbon Nanotube/Polymer Composites"
9:15 pm - 9:30 pm	Discussion

Monday

7:30 am - 8:30 am	Breakfast
8:30 am	Group Photo

9:00 am - 12:30 pm

Self-Healing, Remodeling and Regeneration

Discussion Leader: **Ellen Arruda** (University of Michigan, USA)

9:00 am - 9:05 am Introduction by Discussion Leader

9:05 am - 9:40 am **Richard Weinkamer** (Max Planck Institute of Colloids and Interfaces, Germany)
"Osteocyte Networks, Functional Porosity and Continuous Damage Repair in Bone"

9:40 am - 10:00 am Discussion

10:00 am - 10:25 am Coffee Break

10:25 am - 11:00 am **Thomas Speck** (Albert-Ludwigs-Universitaet Freiburg, Germany)
"Learning from Plants for Bio-Inspired Self-Healing Materials and Structures"

11:00 am - 11:20 am Discussion

11:20 am - 11:55 am **Jeffrey Moore** (University of Illinois at Urbana-Champaign, USA)
"Design of Self-Healing Structural Composite Materials"

11:55 am - 12:15 pm Discussion

12:15 pm - 12:25 pm Late-Breaking Topic

12:25 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm Dinner

7:30 pm - 9:30 pm

Modeling and Simulation

Discussion Leader: **Martin Dunn** (Singapore University of Technology and Design, Singapore)

7:30 pm - 7:35 pm Introduction by Discussion Leader

7:35 pm - 8:10 pm **Anna Balazs** (University of Pittsburgh, USA)
"Designing Sensory and Adaptive Composite Materials"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:05 pm **Sharon Glotzer** (University of Michigan, USA)
"Reconfigurable Materials from Programmable Colloids"

9:05 pm - 9:25 pm Discussion

9:25 pm - 9:30 pm General Discussion

Tuesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm

Self-Cooling and Thermal Management

Discussion Leader: **George Lesieutre** (The Pennsylvania State University, USA)

9:00 am - 9:05 am Introduction by Discussion Leader

9:05 am - 9:40 am **Abraham Stroock** (Cornell University, USA)
"Plant-Inspired Designs for Efficient Heat Transfer"

9:40 am - 10:00 am Discussion

10:00 am - 10:25 am Coffee Break

10:25 am - 11:00 am **Nancy Sottos** (University of Illinois at Urbana-Champaign, USA)
"Self-Cooling of Structural Polymers and Composites"

11:00 am - 11:20 am	Discussion
11:20 am - 11:55 am	Aaron Esser-Kahn (University of California, Irvine, USA) "Microvascular Systems for Mass and Energy Transport"
11:55 am - 12:15 pm	Discussion
12:15 pm - 12:25 pm	Ping Liu (Advanced Research Projects Agency-Energy, USA) "Recent Trends in Multifunctional Energy Storage Systems"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<u>Poster Session</u>
6:00 pm	Dinner
7:30 pm - 9:30 pm	Self-Powered Systems Discussion Leader: Shashank Priya (Virginia Tech, USA) Introduction by Discussion Leader
7:30 pm - 7:35 pm	
7:35 pm - 8:10 pm	Eric Wetzel (U.S. Army Research Laboratory, USA) "Structural Integration of Energy Harvesting and Storage Systems"
8:10 pm - 8:30 pm	Discussion
8:30 pm - 9:05 pm	Leif Erik Asp (Chalmers University of Technology, Sweden) "Multifunctional Structural Power Composites"
9:05 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion

Wednesday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Adaptive Materials Discussion Leader: Ray Baughman (University of Texas at Dallas, USA) Introduction by Discussion Leader
9:00 am - 9:05 am	
9:05 am - 9:40 am	Richard Vaia (U.S. Air Force Research Laboratory, USA) "Mechanical Adaptivity: Material Design from Molecular to Emergent"
9:40 am - 10:00 am	Discussion
10:00 am - 10:25 am	Coffee Break
10:25 am - 11:00 am	Andre Studart (ETH Zurich, Switzerland) "Bio-Inspired Materials that Self-Shape Through Programmed Microstructures"
11:00 am - 11:20 am	Discussion
11:20 am - 11:55 am	Chiara Daraio (ETH Zurich, Switzerland) "Plant Nanobionic Materials"
11:55 am - 12:15 pm	Discussion
12:15 pm - 12:25 pm	David Stepp (U.S. Army Research Office, USA) "Recent Trends of Research Activities on Force-Activated Materials"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<u>Poster Session</u>

6:00 pm	Dinner
7:00 pm - 7:30 pm	<u>Business Meeting</u>
	<i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i>
7:30 pm - 9:30 pm	Actuation and Morphing
	Discussion Leader: Jayanth Kudva (NextGen Aeronautics, Inc., USA)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 8:10 pm	Daniel Inman (University of Michigan, USA) "From Wing Warping to Morphing Wing, the Legacy of the Wright Brothers Continues"
8:10 pm - 8:30 pm	Discussion
8:30 pm - 9:05 pm	Graham Taylor (Oxford University, United Kingdom) "Dynamic Reconfigurations of Bird Wing During Adaptive Gliding Flight"
9:05 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion

Thursday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Multifunctional Design Optimization
	Discussion Leader: James Thomas (U.S. Naval Research Laboratory, USA)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:40 am	Somnath Ghosh (Johns Hopkins University, USA) "An Integrated Spatio-Temporal Multi-Scale Computational Modeling System"
9:40 am - 10:00 am	Discussion
10:00 am - 10:25 am	Coffee Break
10:25 am - 11:00 am	Ioannis Chasiotis (University of Illinois at Urbana-Champaign, USA) "Micro- and Nano-Structures for Multifunctional Interfaces"
11:00 am - 11:20 am	Discussion
11:20 am - 11:55 am	James Guest (Johns Hopkins University, USA) "Topology Optimization for the Design of Multifunctional Material Architectures"
11:55 am - 12:15 pm	Discussion
12:15 pm - 12:25 pm	Massimo Ruzzene (National Science Foundation, USA) "Recent Trends in Metamaterials and Non-Reciprocal Materials"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<u>Poster Session</u>
6:00 pm	Dinner
7:30 pm - 9:30 pm	Processing and Manufacturing Issues
	Discussion Leader: Jeffery Baur (U.S. Air Force Research Laboratory, USA)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 8:10 pm	Daniel Therriault (Ecole Polytechnique de Montreal, Canada) "3D Printing of Multifunctional Composites and Polymers"

8:10 pm - 8:30 pm	Discussion
8:30 pm - 9:05 pm	H. Jerry Qi (Georgia Institute of Technology, USA) "4D/5D Printed Composites for Topology Transforming Devices"
9:05 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	Closing Remarks

Friday

7:30 am - 8:30 am	Breakfast
9:00 am	Departure

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

REGISTRATION LIST
Multifunctional Materials & Structures - 2016

<u>Name</u>	<u>Organization</u>	<u>Participation</u>	<u>Status</u>
Adnan, Ashfaq	University of Texas at Arlington	Attendee	Registered
Antartis, Dimitrios	University of Illinois at Urbana-Champaign	Poster Presenter	Registered
Arrieta, Andres	Purdue University	Poster Presenter	Registered
Arruda, Ellen M	University of Michigan	Discussion Leader	Registered
Asp, Leif Erik	Chalmers University of Technology	Speaker	Registered
Athanasopoulos, N	University of Patras	Poster Presenter	Registered
Balazs, Anna C	University of Pittsburgh	Speaker	Registered
Barth, Friedrich G.	University of Vienna	Attendee	Registered
Baughman, Ray H	University of Texas at Dallas	Discussion Leader	Registered
Baur, Jeffery	U.S. Air Force Research Laboratory	Discussion Leader	Registered
Bergamini, Andrea E.	ETH Zürich	Poster Presenter	Registered
Bielefeldt, Brent	Texas A&M University	Poster Presenter	Registered
Boechler, Nicholas S	University of Washington	Poster Presenter	Registered
Bonanomi, Luca	ETH Zurich	Poster Presenter	Registered
Bond, Ian P	University of Bristol	Poster Presenter	Registered
Boucher, Robert	The Boeing Company	Attendee	Registered
Brinson, Catherine	Northwestern University	Poster Presenter	Registered
Brubaker, Kyle	University of California, Irvine	Poster Presenter	Registered
Bruck, Hugh A	University of Maryland	Poster Presenter	Registered
Carman, Gregory	University of California at Los Angeles	Attendee	Registered
Celestine, Asha-Dee	Harvard University	Attendee	Registered
Cha, Sang-Ho	Kyonggi University	Poster Presenter	Registered
Chang, Fu-Kuo	Stanford University	Speaker	Registered
Chasiotis, Ioannis	University of Illinois at Urbana-Champaign	Speaker	Registered
Chen, Yong	University of California, Los Angeles	Speaker	Registered
Chien, Chihchun	University of California, Merced	Poster Presenter	Registered
Chung, Jaeyoon	University of California Irvine	Poster Presenter	Registered
Correll, Nikolaus	University of Colorado	Poster Presenter	Registered
Coulais, Corentin	FOM Institute AMOLF	Poster Presenter	Registered
Danesh, Cameron D	UCLA	Poster Presenter	Registered
Daraio, Chiara	ETH Zurich	Speaker	Registered
Di Giacomo, Raffaele	ETH Zurich D-MAVT	Poster Presenter	Registered
Dickinson, Benjamin	Air Force Research Laboratory	Poster Presenter	Registered
Domann, John P	University of California, Los Angeles	Poster Presenter	Registered
Dou, Nicholas G	Caltech	Poster Presenter	Registered
Dunn, Martin L	Singapore University of Technology and Design	Discussion Leader	Registered
Elbanna, Ahmed E	University of Illinois Urbana Champaign	Poster Presenter	Registered
Ermanni, Paolo	ETH Zurich	Poster Presenter	Registered
Erturk, Alper	Georgia Tech	Poster Presenter	Registered
Esser-Kahn, Aaron P	University of California, Irvine	Speaker	Registered
Filocamo, Shaun F	US Army NSRDEC	Poster Presenter	Registered

Fisher, Timothy S	Purdue University	Poster Presenter	Registered
Gamble, Lawren L	University of Michigan	Poster Presenter	Registered
Garg, Mayank	University of Illinois at Urbana Champaign	Poster Presenter	Registered
Geubelle, Philippe H	University of Illinois	Poster Presenter	Registered
Ghosh, Somnath	Johns Hopkins University	Speaker	Registered
Gladman, Amelia S	Harvard University	Poster Presenter	Registered
Glotzer, Sharon C	University of Michigan	Speaker	Registered
Greenhalgh, Emile S	Imperial College London	Attendee	Registered
Grocholski, Brent	American Association for the Advancement of Science	Attendee	Registered
Groehn, Franziska	University Erlangen	Poster Presenter	Registered
Guest, James	Johns Hopkins University	Speaker	Registered
Gupta, Satyandra K	University of Maryland	Poster Presenter	Registered
Hahn, Gail L	Boeing Research & Technology	Attendee	Registered
Hajela, Prabhat	Rensselaer Polytechnic Institute	Attendee	Registered
Handa, Sheetal	BP International Ltd.	Attendee	Registered
Hanna, Yohanna G	University of Southern California	Poster Presenter	Registered
Hao, Menglong	Purdue University	Poster Presenter	Registered
Hartl, Darren J	Air Force Research Lab / Texas A&M Univ.	Poster Presenter	Registered
He, Ximin Tracy	Arizona State University	Poster Presenter	Registered
Herrera, Steven A	University of California, Riverside	Poster Presenter	Registered
Hopkins, Jonathan B	UCLA	Poster Presenter	Registered
Hosseinioust, Zeinab	Max Planck Institute for intelligent systems	Poster Presenter	Registered
Huang, Guoliang	University of Missouri	Poster Presenter	Registered
Hwang, Dong Soo	Pohang University of Science and Technology	Poster Presenter	Registered
Inman, Daniel	University of Michigan	Speaker	Registered
Jayan, B. Reerja	Carnegie Mellon University	Poster Presenter	Registered
Joo, James	AFRL/RQVC	Attendee	Registered
Jovanova, Jovana J	Pennsylvania State University	Poster Presenter	Registered
Kang, Sung H	Johns Hopkins University	Poster Presenter	Registered
Kieffer, John	University of Michigan	Attendee	Registered
Kim, Yoonseob	University of Michigan, Ann Arbor	Poster Presenter	Registered
Kim, Seon Jeong	Hanyang University	Attendee	Registered
Kim, Shi Hyeong	Hanyang University	Poster Presenter	Registered
Kim, Keon Jung	Hanyang University	Poster Presenter	Registered
Kisailus, David J.	University of California at Riverside	Attendee	Registered
Kleiman, Maya	University of California, Irvine	Poster Presenter	Registered
Kotov, Nicholas	University of Michigan	Poster Presenter	Registered
Kraus, Tobias	INM – Leibniz Institute for New Materials	Poster Presenter	Registered
Kudva, Jayanth	NextGen Aeronautics, Inc.	Discussion Leader	Registered
Lacarbonara, Walter	Sapienza University of Rome	Attendee	Registered
Lagoudas, Dimitris	Texas A&M Engineering	Poster Presenter	Registered
LaMattina, Bruce	Charlotte Research Institute	Attendee	Registered
Lamoureux, Aaron	University of Michigan	Poster Presenter	Registered
Lawton, Timothy J	NSRDEC	Poster Presenter	Registered
Lee, Jaeah	University of Texas at Dallas	Poster Presenter	Registered

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Lee, Kyung Jin	Chungnam National University	Attendee	Registered
Lee, Howon	Rutgers University	Poster Presenter	Registered
Lee, Hye-Eun	Seoul National University	Poster Presenter	Registered
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Leo, Donald	University of Georgia	Discussion Leader	Registered
Lesieutre, George	The Pennsylvania State University	Discussion Leader	Registered
Li, Wenle	University of Illinois Urbana-Champaign	Poster Presenter	Registered
Li, Guoqiang	Louisiana State University/Southern University	Poster Presenter	Registered
Li, Yaning	University of New Hampshire	Poster Presenter	Registered
Liu, Ping	Advanced Research Projects Agency-Energy	Speaker	Registered
Liu, Liping	Rutgers University	Attendee	Registered
Lopez Hernandez, H	University of Illinois	Poster Presenter	Registered
Lu, Nanshu	University of Texas at Austin	Poster Presenter	Registered
Lynch, Christopher	UCLA	Poster Presenter	Registered
Maute, Kurt	University of Colorado.	Poster Presenter	Registered
McEvoy, Michael	University of Colorado at Boulder	Poster Presenter	Registered
Mello, Charlene M	US Army Natick Soldier RDEC	Attendee	Registered
Minnich, Austin	Caltech	Poster Presenter	Registered
Mminary, Majid	University of Texas at Dallas	Poster Presenter	Registered
Mohapatra, Hemakesh	University of California Irvine	Poster Presenter	Registered
Monner, Hans P	DLR - German Aerospace Center	Attendee	Registered
Mooney, Damian A	University College Dublin	Attendee	Registered
Moore, Jeffrey S	University of Illinois at Urbana-Champaign	Speaker	Registered
Mouritz, Adrian	RMIT University	Attendee	Registered
Nayakanti, Nigamaa	Massachusetts Institute of Technology	Poster Presenter	Registered
Nepal, Dhriti	Air Force Research Lab	Attendee	Registered
Ochoa, Ozden O	Texas A&M University	Attendee	Registered
Olson, Jeff	Lockheed Martin Space Systems Company	Poster Presenter	Registered
Peijs, Ton	Queen Mary University of London	Poster Presenter	Registered
Pelegri, Assimina	Rutgers University	Poster Presenter	Registered
Prakash, Vikas	Case Western Reserve University	Attendee	Registered
Priya, Shashank	Virginia Tech	Discussion Leader	Registered
Qi, H. Jerry	Georgia Institute of Technology	Speaker	Registered
Qidwai, Siddiq	US Naval Research Laboratory	Poster Presenter	Registered
Reich, Gregory	Air Force Research Laboratory	Attendee	Registered
Reichl, Katherine K	University of Michigan, Ann Arbor	Poster Presenter	Registered
Reid, Russell C	Naval Research Laboratory	Poster Presenter	Registered
Reitz, Thomas L	Air Force Research Laboratory	Poster Presenter	Registered
Rivera, Jesus	University of California, Riverside	Poster Presenter	Registered
Roberts, Christopher C	University of California, Los Angeles	Poster Presenter	Registered
Robertson, Ian D	University of Illinois Urbana-Champaign	Poster Presenter	Registered
Rosenbury, C	University of North Carolina at Charlotte	Poster Presenter	Registered
Roy, Ajit K	Air Force Research Laboratory	Poster Presenter	Registered
Ruzzene, Massimo	National Science Foundation	Speaker	Registered

Sanders, Brian	Embry-Riddle Aeronautical University	Attendee	Registered
Sarkar, Swarnavo	National Institute of Standards and Technology	Poster Presenter	Registered
Schaedler, Tobias A	HRL Laboratories, LLC	Poster Presenter	Registered
Schmied, Jascha	ETH Zurich	Attendee	Registered
Shaffer, Christopher	UCLA	Poster Presenter	Registered
Shaw, John A	University of Michigan	Poster Presenter	Registered
Shepherd, Robert F	Cornell University	Poster Presenter	Registered
Shtein, Max	University of Michigan	Poster Presenter	Registered
Shyu, Terry	University of Michigan	Poster Presenter	Registered
Siegmund, Thomas	Purdue University	Poster Presenter	Registered
Skorb, Katsiaryna	Max Planck Institute of Colloids and Interfaces	Attendee	Registered
Smith, Lisa	Texas A&M University	Poster Presenter	Registered
Sodano, Henry A	University of Michigan	Attendee	Registered
Sottos, Nancy R	University of Illinois at Urbana-Champaign	Vice Chair	Registered
Speck, Thomas	Albert-Ludwigs-Universitaet Freiburg	Speaker	Registered
Stepp, David M	U.S. Army Research Office	Speaker	Registered
Stroock, Abraham D	Cornell University	Speaker	Registered
Studart, Andre R	ETH Zurich	Speaker	Registered
Sugino, Christopher	Georgia Institute of Technology	Poster Presenter	Registered
Tabarraei, Alireza	University of North Carolina at Charlotte	Poster Presenter	Registered
Talo, Michela	Sapienza University of Rome	Poster Presenter	Registered
Taylor, Graham	Oxford University	Speaker	Registered
Thakre, Piyush R	Dow Chemical Company	Attendee	Registered
Therriault, Daniel	Ecole Polytechnique de Montreal	Speaker	Registered
Thomas, James P	U.S. Naval Research Laboratory	Vice Chair	Registered
Tracy, Joseph B	North Carolina State University	Poster Presenter	Registered
Truby, Ryan L	Harvard University, Paulson School of Engineering	Poster Presenter	Registered
Tudor, Andrew	University of California, Los Angeles	Poster Presenter	Registered
Uzarski, Joshua R	US Army Natick Soldier Research, Development	Poster Presenter	Registered
Vaia, Richard A	U.S. Air Force Research Laboratory	Speaker	Registered
Volakis, John L	Ohio State University	Attendee	Registered
Wang, Qiming	University of Southern California	Poster Presenter	Registered
Weinkamer, Richard	Max Planck Institute of Colloids and Interfaces	Speaker	Registered
Wetzel, Eric D.	U.S. Army Research Laboratory	Speaker	Registered
White, Scott R	University of Illinois at Urbana-Champaign	Chair	Registered
Wickenheiser, Adam	The George Washington University	Poster Presenter	Registered
Windsor, Shane P	University of Bristol	Poster Presenter	Registered
Xu, Sheng	University of California, San Diego	Attendee	Registered
Yanagisawa, Yu	The University of Tokyo	Poster Presenter	Registered
Yang, Jinkyu	University of Washington	Poster Presenter	Registered
Yaraghi, Nicholas A	University of California, Riverside	Poster Presenter	Registered
Yeom, Bongjun	Myongji University	Poster Presenter	Registered
Yu, Kai	Georgia Institute of Technology	Poster Presenter	Registered
Yushin, Gleb	Georgia Institute of Technology	Poster Presenter	Registered
Zavattieri, Pablo D	Purdue University	Poster Presenter	Registered

Zenkert, Dan
Zhou, Zhong
Zorzetto, Laura
179 Attendees

KTH - Royal Institute of Technology
The University of Texas at Dallas
University of Liege

Attendee	Registered
Poster Presenter	Registered
Poster Presenter	Registered